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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,284	03/29/2004	Ali S. Sadri	1000-0032	2248

7590 04/10/2007

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EXAMINER	
GELIN, JEAN ALLAND	
ART UNIT	**PAPER NUMBER**
2617	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,284	SADRI ET AL.	
	Examiner	Art Unit	
	Jean A. Gelin	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 13-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Catreux et al. (US 2002/0183010).

Regarding claim 1, Catreux teaches a wireless apparatus (fig. 3 and fig. 6) comprising: an adaptive channelization controller to determine which of a plurality of predetermined sub-channels to use to support a multicarrier wireless link, based on channel state information ([0022], [0024], and [0038]); and a receiver chain to process a received multicarrier signal associated with said multicarrier wireless link based on control information output by said adaptive channelization controller ([0027] and [0042]-[0043]).

Regarding claim 2, Catreux teaches further comprising: a transmitter chain to generate a multicarrier transmit signal for said multicarrier wireless link based on control information output by said adaptive channelization controller ([0021]-[0022] and [0024]-[0028]).

Regarding claim 15, Catreux teaches said adaptive channelization controller, said receiver chain, and said transmitter chain are all implemented on the same semiconductor chip (fig. 3 or fig. 6).

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 18-20, 22-26, 29-33, and 37-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Walton et al. (US 6,785,641).

Regarding claim 18, Walton teaches a wireless apparatus (fig. 3 and fig. 5) comprising: a frequency demultiplexer to separate a received multicarrier signal into multiple portions based on frequency, said multiple portions corresponding to a plurality of predetermined frequency sub-channels and including at least a first portion and a second portion (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65); a first Fourier transform unit to convert said first portion of said multicarrier signal from a time domain representation to a frequency domain representation (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65); and a second Fourier transform unit to convert said second portion of said multicarrier signal from a time domain representation to a frequency domain representation, separately from said first portion of said multicarrier signal (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65).

Regarding claim 19, Walton teaches said second Fourier transform unit is a different unit from said first Fourier transform unit (fig. 3).

Regarding claim 20, Walton teaches said first and second Fourier transform units are the same unit, wherein said unit processes said first and second portions of said multicarrier signal at different times (col. 7, line 46 to col. 8, line 57, and col. 15, lines 20-65).

Regarding claim 22, Walton teaches an adaptive channelization controller to determine which of said plurality of predetermined frequency sub-channels to use to support a multicarrier wireless link, based on channel state information (col. 6, line 56 to col. 7, line 45).

Regarding claim 23, Walton teaches said received multicarrier signal is an orthogonal frequency division multiplexing (OFDM) multicarrier signal (col. 7, line 46 to col. 8, line 63).

Regarding claim 24, Walton teaches at least one other Fourier transform unit to convert at least one other portion of said multicarrier signal from a time domain representation to a frequency domain representation (col. 7, line 46 to col. 8, line 63).

Regarding claim 25, Walton teaches said frequency demultiplexer includes an analog filter (col. 19, lines 33-44).

Regarding claims 26, 37, Walton teaches acquiring channel state information associated with a channel having a plurality of sub-channels (col. 5, lines 50-65, col. 7, lines 47 to col. 8, line 56); determining which sub-channels within said plurality of sub-channels to use for a wireless link based on said channel state information (col. 2, lines 52-59 and col. 5, lines 11-67); and delivering sub-channel adaptation information to a

receiver chain for use in processing a multicarrier receive signal associated with said wireless link (col. 5, lines 1-67).

Regarding claims 29, 38, Walton teaches determining which sub-channels within said plurality of sub-channels to use for said wireless link includes identifying sub-channels that are not currently being used by other links (col. 6, line 56 to col. 7, line 45).

Regarding claims 30, 39, Walton teaches delivering sub-channel adaptation information to a transmitter chain for use in generating a multicarrier transmit signal for said wireless link (col. 5, lines 1-67).

Regarding claim 31, Walton teaches dividing a received multicarrier signal into a plurality of frequency sub-channel components (fig. 3, items 310, col. 15, lines 41-58); and individually transforming each of said plurality of frequency sub-channel components from a time domain representation to a frequency domain representation (col. 8, lines 37-57, col. 17, lines 10-33, and col. 32, line 63 to col. 33, line 49).

Regarding claim 32, Walton teaches converting said frequency domain representations resulting from individually transforming said plurality of frequency sub-channel components to a single serial stream based on control information received from an adaptive channelization controller (col. 7, line 46 to col. 8, line 62).

Regarding claim 33, Walton teaches individually transforming includes applying each of said plurality of frequency sub-channel components to a separate Fourier transform unit (see fig. 3, (col. 7, line 46 to col. 8, line 62).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3-4, 6, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catreux in view of Walton et al. (US 6,785,341).

Regarding claim 3, Catreux teaches all the limitations above except said receiver chain includes a frequency demultiplexer to separate said received multicarrier signal into multiple portions based on frequency, said multiple portions corresponding to said plurality of predetermined sub-channels.

However, the preceding limitation is known in the art of communications. Walton teaches in fig. 5 a receiver having a demultiplexer to channelize the modulation symbol vector streams from each FFT processor into a number of modulation symbol streams, and each frequency sub-channel is independently processed (col. 15, lines 20-57 and col. 16, line 50 to col. 17, line 6). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Walton within the system Catreux in order to process data in MIMO communication system utilizing channel state information to provide improved system performance.

Regarding claim 4, Catreux teaches said received multicarrier signal is an orthogonal frequency division multiplexing (OFDM) signal ([0022]). Walton teaches said receiver chain further includes a plurality of Fourier transform units to separately

process said multiple signal portions output by said frequency demultiplexer (i.e., inside each demodulator of the receiver includes FFT to improve system performance, col. 15, lines 41-57).

Regarding claim 6, Catreux in view of Walton teaches all the limitations above. Walton further teaches said plurality of Fourier transform units includes at least one fast Fourier transform unit (col. 15, lines 44-55).

Regarding claim 10, Catreux teaches all the limitations above except said transmitter chain comprises a forward error correction (FEC) encoder to encode source data and an adaptive mapper to map the encoded data based on a predetermined modulation constellation.

However, the preceding limitation is known in the art of communicatins. Walton teaches the FEC code is selected to be powerfull enough to allow the symbols transmitted from the worse case transmit antenna to be correctly received at the receiver system (col. 33, line 58 to col. 34, line 51 to col. 35, line 16). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Walton within the system of Catreux in order to process data in MIMO communication system utilizing channel state information to provide improved system performance.

7. Claims 5, 7-9, 11, 13, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catreux in view of Walton et al. (US 6,785,341) further in view of Hammerschmidt (US 2004/0151145).

Regarding claim 5, Catreux in view of Walton teaches all the limitations above except a guard interval removal unit between said frequency demultiplexer and said plurality of Fourier transform units to remove guard intervals from said multiple signal portions output by said frequency demultiplexer.

However, the preceding limitation is known in the art of communications. Hammerschnidt teaches in fig. 1 a receiver having removable circuitry to strip each symbol of the cyclic prefix and applies the result to a converter ([0009] and [0030]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Catreux in view of Walton in order to remove noise in the received signal, reduce interferences, and increase signal quality.

Regarding claim 7, Catreux in view of Walton further in view of Hammerschmidt teaches all the limitations above except said receiver chain further includes an adaptive parallel to serial converter to receive output streams from said plurality of Fourier transform units and to merge said output streams into a serial stream based on control information from said adaptive channelization controller.

However, the preceding limitation is known in the art of communications. Hammerschnidt discloses in fig. 2 that the parallel to serial converter (236) receives output streams from FFT (234) to convert data received from the FFT ([0030]-[0034]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of

Catreux in view of Walton in order to improve communication channel, reduce emitted RF power, and reduce electrical power consumption.

Regarding claim 8, Catreux in view of Walton further in view of Hammerschmidt teaches all the limitations above. Hammerschnidt further discloses said adaptive parallel to serial converter ignores output streams that are associated with sub-channels that are not currently used in support of said multicarrier wireless link ([0030]-[0034]).

Regarding claim 9, Catreux in view of Walton further in view of Hammerschmidt teaches all the limitations above. Hammerschnidt further discloses said receiver chain further includes an adaptive demapper to demap data within said serial stream output by said adaptive parallel to serial converter based on control information from said adaptive channelization controller ([0009], [0031], [0041], and [0042]).

Regarding claim 11, Catreux in view of Walton further in view of Hammerschmidt teaches all the limitations above except said transmitter chain further comprises an adaptive serial to parallel converter to convert a serial stream output by said adaptive mapper to a parallel format based on control information from said adaptive channelization controller.

However, the preceding limitation is known in the art of communications. Hammerschnidt discloses in fig. 2 that the S/P converter (214) converts serial streams to parallel streams ([0031] and [0052]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Catreux in view of Walton in order that the QAM

values are demultiplexed in S/P converter and modulated onto 52 tones using an IFFT element, which tones are combined in P/S converter.

Regarding claim 13, Catreux in view of Walton further in view of Hammerschmidt teaches all the limitations above. Hammerschnidt (fig.2) further discloses said multicarrier transmit signal is an orthogonal frequency division multiplexing (OFDM) signal ([0008]); and said transmitter chain further includes an inverse Fourier transform unit to convert a parallel output signal of said adaptive serial to parallel converter from a frequency domain representation to a time domain representation ([0008] and [0030]).

Regarding claim 14, Catreux in view of Walton further in view of Hammerschmidt teaches all the limitations above. Hammerschnidt further discloses said transmitter chain further includes a guard interval addition unit to add a guard interval to said time domain representation output by said inverse Fourier transform unit ([0008], [0009], and [0030]).

8. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Catreux in view of Hammerschmidt (US 2004/0151145).

Regarding claims 16-17, Catreux teaches all the limitations above except said channel state information includes information received from a remote location.

However, the preceding limitation is known in the art of communications. Hammerschmidt teaches two circuits are controlled by a channel state information (CSI) processor to receive signals from RF receivers and MAC ([0032]-[0034]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Catreux in order to

extend the range corresponding to a selected transmission bit rate and or to increase the transmission bit rate between an access point and a client terminal.

9. Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al. (US 6,785,341) further in view of Hammerschmidt (US 2004/0151145).

Regarding claim 21, Walton teaches all the limitations above except a guard interval removal unit between said frequency demultiplexer and said firstFourier transform units to remove guard intervals from said first signal portions before said first signal portion reaches said first Fourier transform unit.

However, the preceding limitation is known in the art of communications. Hammerschnidt teaches in fig. 1 a receiver having removable circuitry to strip each symbol of the cyclic prefix and applies the result to a converter ([0009] and [0030]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Walton in view of Walton in order to remove noise in the received signal, reduce interferences, and increase signal quality.

10. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton in view of Hammerschmidt (US 2004/0151145).

Regarding claims 27-28, Walton teaches all the limitations above except said channel state information includes information received from a remote location.

However, the preceding limitation is known in the art of communications. Hammerschmidt teaches two circuits are controlled by a channel state information (CSI) processor to receive signals from RF receivers and MAC ([0032]-[0034]). Therefore, it

would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Hammerschmidt within the system of Walton in order to extend the range corresponding to a selected transmission bit rate and or to increase the transmission bit rate between an access point and a client terminal.

11. Claims 34-36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al. (US 6,785,341) further in view of Maltsev et al. (US 2004/0190637).

Regarding claims 34, and 36, Walton teaches an adaptive channelization controller to determine which of a plurality of predetermined sub-channels to use to support a multicarrier wireless link, based on channel state information (col. 6, line 56 to col. 7, line 45); and a receiver chain to process said received multicarrier signal based on control information output by said adaptive channelization controller (col. 6, line 56 to col. 7, line 45).

Walton fails to teach at least one dipole antenna to receive a multicarrier signal associated with said wireless link.

However, the preceding limitation is known in the art of communications. Maltsev teaches an OFDM unit having a dipole antenna suitable for reception and transmission of multicarrier communication signals including OFDM packets ([0016]). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention, to implement the technique of Maltsev within the system of Walton in order to receive signals that includes OFDM packets.

Regarding claim 35, Walton teaches an adaptive channelization controller determines which of said plurality of predetermined sub-channels to use to support said multicarrier wireless link by identifying sub-channels that are currently being utilized by other wireless links (col. 6, line 56 to col. 7, line 45).

Allowable Subject Matter

12. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim et al.	US 2004/0132496 A1	07/08/2004
Kannan et al.	US 2004/0001535	01/01/2004
Geile et al.	US 2003/0032390	02/13/2003
Tang et al.	US 2005/0128935	06/16/2005

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean A. Gelin whose telephone number is (571) 272-7842. The examiner can normally be reached on 9:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JGelin
April 2, 2007

JEAN GELIN
PRIMARY EXAMINER